REMARKS

Claims 29, 32, 34-39, 41-53, 56, and 57 are pending. Claims 1-28, 30-31, 33, 40-42, and 54-55 have been canceled (41 and 42 newly canceled). Claims 37 and 43-53 have been withdrawn from consideration. Claim 36 has been allowed, and claim 38 has been amended.

Claims 29, 34, 35, 38, 41, 42, 56, and 57 stand rejected under 35 USC § 103(a) as obvious over WO 200044472 (Insley U.S. 6,280,824) in view of Jensvold (US 6,153,097). This rejection is moot as to canceled claims 41-42 and is traversed as to the remainder of the claims.

Attached hereto is a table comparing certain elements in the claims in the application with the disclosures of the references cited. If a listed element of the present claims was found in a reference, it was noted by its location in the reference in the table. A blank space in the table corresponding to a claim element indicates that no disclosure of that claim element was found in the reference. The table is a convenient summary of the differences between certain pending claims and the references. The abbreviated descriptions of the claim elements are for purposes of convenient presentation in the table and do not change the actual claim language or scope.

The Examiner's Response to Arguments are rebutted below. At Office Action p. 3, line 16, the Examiner has said, "Insley '824 teaches every element of the presently claimed subject matter except the contour structured layer being formed from a microporous membrane of foam." The rejected claims do not recite a contour structured layer formed from a microporous membrane of foam. The layer in the claimed layered sheet construction with structure is b. the gas delivery layer. The microporous layer is the gas permeable, water impermeable layer a. of the present claims, which may be contoured (as shown in figures 2 and 6) but may also be flat (as shown in figures 1, 3, and 4).

Insley '824 does not teach the following elements of the rejected claims:

1. at least one gas permeable, water impermeable layer (all claims);
2. coated with a gas permeable, polymeric coating (claims 29, 34 and 35);
3. gas permeable, water impermeable microporous membrane layer being oleophobic because of: i. coating of fluorochemical of fluoropolymer; ii. surface treated with ionizing radiation or plasma discharge in presence of gaseous fluorinated species; iii. fluorochemical additives in the layer; or iv. coating of polydimethylsiloxane (claim 38);

4. a microbial support layer on the gas permeable, water impermeable layer of part a. (claims 56 and 57).

In the text of the Office Action bridging pages 3 and 4, the Examiner has said, "In view of Jensvold, one ... would be motivated to replace the contoured structured layer with the microporous membrane or the foam of the Jensvold invention for the high separation efficiency, cost effectiveness, improved mechanical properties and higher resistance to temperature variations (Jensvold column 1, lines 24-26 and column 2, lines 1-5)." These parts of Jensvold have been taken out of context. Jensvold column 1, lines 24-26 is in his Background section discussing the prior art, and it attributes the properties of resistance to temperature variations and mechanical strength to hollow fiber membranes known in the art. In the case of hollow fiber membranes, gas is fed to the bore side of the fibers and exits through the hollow fiber walls. In the case of gas permeable, water impermeable layer of the present claims, gas passes from the side near the gas delivery layer, through the layer to the opposite side. Jensvold column 2, lines 1-5 attributes the benefit of cost effectiveness to Jensvold's gas separation device, not to a microporous layer. Therefore, the motivation to use a gas permeable, water impermeable microporous layer in the contoured layer channel flow filtration media of Insley is not provided by Jensvold.

At Office Action page 4, the Examiner has found the Insley declaration (submitted with the last response) unpersuasive because no factual evidence or data were provided. Data are not required. Mr. Insley is a named inventor of the primary reference patent with more than 24 years of experience in research in fields including structured films and filtration media. He is eminently qualified to interpret his own patent and to opine regarding what would be obvious to a person skilled in the art in view of Insley '824 and Jensvold. His opinion should be given weight and accepted as probative regarding what is obvious to a skilled person. The points made in his Declaration, Paragraph 4 (a) and (b) do not require data for substantiation. Paragraph 4(a) establishes that the orientation of the Insley '824 filtration media is such that the array of flow channels (e.g., formed by the stack of filtration media, as shown in Insley Fig. 6) is the face of the filtration medium which is orthogonal to the flow of air to be filtered. Paragraph 4(b) states that there is no means disclosed in Insley '824 for using the hollow fiber membranes of Jensvold, which is evident from a reading of the patents.

The Examiner has admitted at Office Action page 4, lines 10-12, that Jensvold teaches flow channels made from foam to promote appropriate flow along the length of the foam material. The flow of gas in the present invention is across the gas permeable, water impermeable layer, from the side nearest the gas delivery layer to the other side (on which bacteria grow) not along its length. High void fraction cellofoam, as disclosed in Jensvold, is not the same as the gas permeable, water impermeable microporous layer of the rejected claims. High void fraction foam would likely be water permeable.

Although foam may be a strong enough material for Jensvold's permeate flow channels, his teaching of foam does not make substitution into Insley obvious, because there is no evidence that Jensvold's foams would benefit Insley's contoured polymeric film layer. In Insley's specification, the structured or contoured film layers are made of solid polymer (see the examples) which one would expect to be stronger than foam.

At Office Action p. 4, ll. 16-20, the Examiner asserted that Insley '824, column 3, ll. 60-66 states that Insley's cap layer can be contoured and cover all portions of the contoured film layer. To the contrary, Insley, col. 3, ll 61-63 says, "A cap layer is a layer which is in engagement, or contact, with the peaks or ridges on one face of the contoured film layers." The cap layers illustrated in Insley '824 are layers 11 in Figs. 5, 5A, and 6, and layer 62 in Fig. 10 and "engagement" with the peaks or ridges is not contact with the rest of the contoured film layers. Although Insley '824 says the cap layers may be contoured, the only contoured layers he shows that are analogous to cap layers are top and bottom layers 31 in Fig. 7, and (like the other cap layers) they only contact the peaks of the contoured film layers (see Col. 4, ll. 51-53). Insley '824 says nothing to indicate that his contoured cap layer is a coating (i.e., a layer that contacts and conforms to its substrate) like the gas permeable, polymeric coating of the rejected claims. The coatings discussed in the present application are fluoropolymer or other coatings (e.g., polydimethylsiloxane) at specification p. 8, ll. 20-24 and p. 9, ll. 1-6, and are not like Insley's cap layers.

In the sentence bridging Office Action pages 4 and 5, the Examiner has said, "Applicants argue that the contoured film layer does not contain fluorochemical additives...." That is not the case. Applicants argued (and still argue) that Insley does not disclose fluorochemical additives in a gas permeable, water impermeable, microporous membrane. Insley's contoured film layer may

contain fluorochemical additives, but the combination of fluorochemical additives and gas permeable, water impermeable, microporous membrane is not found in Insley '824.

The Examiner has referred to Insley '824, col. 5, ll. 50-55 to show that Insley's contoured film is a filter layer. Applicant's do not deny that Insley's contoured layer is a layer in a filter. However, his contoured layer is oriented parallel to the air stream in use (since it forms part of the flow channels through which air is to travel), and Insley's contoured layer is not a gas permeable, water impermeable, microporous layer.

In the first full paragraph on Office Action p. 5, the Examiner has disagreed with applicants' argument regarding the absence of any teaching of a microbial support layer in Insley '824 (applicant's last response dated June 8, 2005, pp. 9-10). She has said that Insley Fig. 8 shows a contoured film layer joined to a non-woven layer. That is not the case. Insley, column 4, lines 6-9 states, "Fig. 8 shows a contoured film layer 40 . . . joined to stabilization filaments 42 at peaks 44 of the contoured film layer 40." Stabilization filaments are not a non-woven layer; they are discrete, parallel filaments as shown in Insley Fig. 8.

The Examiner has said that Insley discloses a cap film layer that would need to join to the contoured film layer (col. 4, ll. 6-11). That is a cap layer for film 40 in Fig. 8. Cap layers are described at col. 3, ll. 59-67, and they engage the peaks or ridges of the contoured film layers. Such a cap layer would not constitute a microbial support layer as claimed in present claims 56 and 57. The microbial support layer is a layer suitable to support the growth of bacteria located on the side of the gas permeable, water impermeable layer opposite the gas delivery layer. A cap layer added to Insley Fig. 8 is nothing like the microbial support layer, since it is not on a gas permeable, water impermeable layer, nor is it said to be suitable for growing bacteria.

The Examiner has gone on to say, "Likewise, the filtration media array has a layer constructions [sic] as follows: cap film layer/contoured film layer/nonwoven layer...." This is not the case. As pointed out in applicant's last response (pp. 9-10) Insley describes hot wire cutting his filtration media array, slicing it at depths of 5-40 mm. (col. 8, lines 46-65, col. 11, lines 13-29 and col. 12, l. 9). The face of the Insley filter medium is the face showing the open flow channels 14 and 16 (e.g., front of Fig. 6). This is supported by the Insley declaration Paragraph 4a., and that is the face over which the non-woven fibrous material is applied in Insley col. 8, lines 40-50. Thus, the nonwoven layer is not layered with the cap film and contoured film

layers, as the Examiner has said, but orthogonally to them. The combination of Insley's array with non-woven fibrous material does not read on the present layered sheet construction in which the microbial support layer is layered over the gas permeable, water impermeable layer of part a.

In the last paragraph of Office Action p. 5, the Examiner has said that applicant's arguments regarding the lack of any reason to combine Jensvold with Insley '824 were not found persuasive. She has asserted that one would combine Jensvold with Insley '824 because both are related to purification apparatus or separation devices. Not all elements of inventions in the general fields of purification apparatus or separation devices are logically combined. There must be a logical reason to take part of one invention and add it to another or substitute it for an element of another invention. The Examiner's reasoning appears at Office Action pp. 5-6.

She has stated that, "Jensvold teaches that the microporous membrane is in the form of a flat sheet, hollow tube, hollow fibers or an open cellulofoam (column 8, lines 1-10, column 10, lines 15-20)." However, Jensvold teaches that these flat sheets, hollow tubes, hollow fibers, etc. are to be used in his gas separation device, an internal staged permeator that separates a mixed gas stream into permeate and retentate streams (used in such processes as distillation and pervaporation, col. 13, ll. 31-45). There is no reason to believe that such flat sheets, hollow tubes, hollow fibers, etc. would be useful in combination with (or in substitution for some part of) Insley's filtration media array. The benefits in Jensvold (to which the Examiner referred) have been discussed above and do not furnish a reason to combine Jensvold with Insley.

At Office Action page 6, the Examiner has said, "Jensvolds [sic] teaches the permeate flow channels made from a foam material have mechanical strength to promote appropriate flow along the length of the flow channels (column 10, lines 10-20)." This point (discussed above) does not provide a reason for combining membranes from Jensvold with the filtration media arrays of Insley '824. Although foam may be a strong enough material for Jensvold's permeate flow channels, his teaching of foam does not make substitution into Insley obvious.

Why would one add Jensvold's foam to Insley or substitute Jensvold's foam for one of Insley's layers when Insley makes his layers of solid polymer in his examples? One would normally expect solid polymer layers to be stronger than foam layers. The Examiner has said the reason is to add strength, but there is no evidence that Jensvold's foams would add strength to Insley's filter arrays. There is also no evidence that the kind of foam Jensvold discusses, even if

placed into Insley's filtration media, would be both gas permeable and water impermeable as required by the rejected claims.

The Examiner has said, "Hence the replacement of Insley's contoured structured layer with the microporous membrane or the foam of the Jensvold invention would in no way interfere with the air flow described in the Insley invention." The mere fact that such a substitution might not interfere with air flow in Insley's invention is hardly a reason motivating a skilled person to make the substitution. The reason to combine must be found in the references or elsewhere in the prior art, and at most the Examiner has put forth a speculative reason why one might try Jensvold's materials in Insley. Obviousness to try is not the standard of 35 U.S.C. 103, In re Tomlinson, 150 U.S.P.Q. 623 (CCPA 1966). Reasons contrary to this combination are found above and in the Insley declaration.

Even if the Examiner's purported substitution were made, the result would not be the presently claimed invention. The layer in the rejected claims having a contour (a plurality of walls and flow channels on at least one side) is the gas delivery layer which is not specified as being porous. After making the substitution suggested by the Examiner, one would have an Insley type filter media array with a contoured polymeric film layer made of the materials described in Jensvold (e.g., hollow tube, hollow fibers, open cellulofoam, etc.) This simply would not be the presently claimed inventions, nor would it make them obvious. The gas delivery layer would be made of hollow tubes, hollow fibers, porous membranes, etc., and the combined Insley/Jensvold device would be missing the:

- gas permeable, polymeric coating of claims 29 and 35;
- various treatments adding oleophobicity in claim 38; and
- microbial support layers of claims 56 and 57.

The modifications needed to the cited references in order to arrive at the rejected claims are too substantial to be obvious.

Claim 32 stands rejected under 35 USC § 103(a) as being unpatentable over WO 200044472 in view of Jensvold et al. (US 6,153,097) and WO 99/65593 (Insley U.S. patent 6,524,488). This rejection is traversed.

In the Insley '488 filtration media, fluid (e.g., air) flows through stacked layers 12 with channels 25 for filtration. There is no air permeable, water impermeable micro-porous layer coated with a gas permeable, polymeric coating (as required by claim 32) found in Insley '488. In the rejection of claim 32 in the prior office action (March 22, 2005) the Examiner cited Insley '488 as teaching a flow channel layer with walls forming flow channels on two sides. Although this feature is also in rejected claim 32, there is no motivation to combine these three patents, and the reasoning against the combination is largely the same as expressed above regarding the combination of Insley '824 with Jensvold. There is no reason to believe that the: benefits mentioned in Jensvold would apply to the Insley '824 or '488 filtration media made with Jensvold type materials; or foam materials mentioned in Jensvold would be gas permeable, water impermeable membranes useful in the layered sheet of claim 32.

Even if the combination were made, it would be missing the gas permeable, polymeric coating required by claim 32. Adding this feature is not a modification obvious from the prior art.

Claim 39 stands rejected under 35 USC § 103(a) as being unpatentable over WO 200044472 in view of Jensvold et al. (US 6,153,097) and WO 99/65593, further in view of Taniguchi et al. (US 6,322,703). This rejection is traversed.

Taniguchi has been cited for disclosure of pore size within the range of rejected claim 39. Taniguchi is about purifying aqueous suspensions with a module comprising wavy hollow fiber membranes, not gas permeable, water impermeable micro-porous membranes. In his process, water to be filtered is by traversing from the outer surfaces, through pores, into the inside of hollow fiber membranes, and out the ends of the hollow fibers (e.g., see col. 13. l. 55-col. 14, l. 6 and claim 1). There is no reason to combine such porous hollow fiber membranes with Jensvold, and the two Insley references. The Examiner's contention of obviousness is only established by picking and choosing features from various patents and combining them with improper hindsight to obtain the invention of the claims at issue. This hindsight reconstruction of claim 39 ignores all reasons contrary to obviousness discussed above. To adopt the one feature (pore size) from Taniguchi to reject claim 39 requires that one use Taniguchi's hollow fiber membrane in a layered sheet construction together with a gas delivery layer having walls forming flow channels and one of the features specified (i.-iv) to give improved oleophobicity (claim 38), in spite of the

fact that Taniguchi uses hollow fibers packed into bundles (col. 7, l. 65-col. 9, l. 12 and Fig. 3), never teaches combining membranes of hollow fibers with any other layer, and does not treat them to improve oleophicity. The modifications needed in order to overcome the differences between Taniguchi and claim 39 are too great to be obvious to a person skilled in the art.

The Examiner said, at pages 10-11 of the Office Action of March 22, 2005 that it would have been obvious to use Taniguchi's hollow fiber membrane because of the desire to achieve filtration efficiency. That explanation fails because: 1. the claimed layered sheet construction is intended for water treatment modules or apparatus in which air is fed from within the layered sheet construction, by means of the gas delivery layer, to bacteria growing on the surface and removing pollutants (specification p. 3-5, 20-21 and original claim 26) not for filtration; 2. one interested in achieving filtration efficiency would not add a gas delivery layer as required by claim 39.

The purported motivations to combine the cited references are not logical. They take reasons or advantages from one invention made for one purpose and say that would cause a skilled person to use Jensvold's membranes or Taniguchi's membranes in constructions as taught by Insley. Jensvold separates volatile from non-volatile components of a gas stream (col. 13-ll. 36-39), and the operation of Taniguchi's membrane is discussed above. The fact that certain membrane materials benefit Jensvold's internal staged permeator or Taniguchi's water filter does not mean they would benefit Insley's filtration media for gases. Even if one were to combine these references, only hindsight reconstruction would teach one to combine them in the way that would duplicate the rejected claims.

The recent case of In re Kumar, 76 U.S.P.Q. 2d 1048 (Fed. Cir 2005) has held that the prior art does not render a later invention obvious unless it enables a person skilled in the art to make and use the claimed invention. In addition to failing to provide all the missing claim elements and to provide a real motivation for making all needed modifications to the references to arrive at the present claims, the cited art does not enable one to make and use the claimed layered sheet constructions.

In view of the above discussion, it is respectfully submitted that claims 29, 32, 34-36, 38, 39, 56, and 57 are in condition for allowance. Withdrawal of the rejections under 35 U.S.C. 103 are requested and a notification of allowability is respectfully solicited. If any issues or questions

remain the resolution of which the Examiner feels would be advanced by a conference with Applicants' attorney, she is invited to contact such attorney at the telephone number noted below.

Respectfully submitted,

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U.S.S.N. 10/017632	**Insley WO 00/44472 (US 6280824)**	**Jensvold** US 6153097	**Insley WO 99/65593 (US 6,524,488)**	**Taniguchi US 6,322,703**
Claims 29, 32, 38, 56, 57 a. ≥1 gas permeable, water impermeable layer				
comprising microporous layer		Col. 8, ll. 8-9		
Claims 29 & 32 coated with gas permeable, polymeric coating				
b. gas delivery layer proximate layer a. comprising base having side with plurality of walls forming separate flow channels through which gas can be conveyed to layer a.	contoured film Figs. 1-4, col. 3, ll. 46-59			
Claim 38 layer a is oleophobic because of i. coating of fluorochemical or fluoropolymer; ii. surface treated with ionizing radiation or plasma discharge in presence of gaseous fluorinated species; iii. fluorochemical additives in layer a.; or iv. coating of polydimethylsiloxane	Fluorochemical additives for oil repellency, **but not for gas permeable, water impermeable microporous layer**, col. 6, ll. 35-41			
Claims 56 & 57 microbial support layer on layer of part a				
Claim 56 loaded with filler: peat, lignite, coal, coke, charcoal, activated carbon	col. 6, ll. 50-51			
Claim 57 carrying a net positive surface charge	charged – col. 5, l. 47-col. 6, l. 33			